¹New Mexico State University, ²University of Oklahoma, ³Oklahoma State University, ⁴USDA Climate Hub, ⁵Zeigler Geologic Consulting

Introduction

Persistent drought, dwindling groundwater resources, and climate variability in western agroecosystems require anticipatory management. Developing short and long-term management strategies that are proactive rather than reactive are essential for maintaining ecological, social, and economic resilience.

Objectives

- 1. link multi-scale (landscape, community, individual) landuse/land-cover dynamics to (national, state, and local) agricultural and groundwater policies
- 2. support effective land and groundwater management by co-producing land use and policy knowledge using citizen science and participatory approaches, and
- 3. develop extension/outreach programs and materials to support resilience-based management strategies in response to drought and climate variability.

Based on the premise that sustainable management solutions are more effectively developed and more likely adopted using participatory approaches including citizen science, our research and extension teams will foster the co-production of knowledge and disseminate this information in formal and informal programs and educational materials.







Agroecosystem Resilience in Times of Drought and Climate Variability

Amy Ganguli¹, Dave Dubois¹, Todd Fagin², Rajan Ghimire¹, Jeanne Gleason¹, Laura Goodman³, Amy Smith Muise¹, Rosanna Sallenave¹, Caiti Steele^{1,4}, Jackie Vadjunec³, Kate Zeigler⁵

Research Areas Water (groundwater & precipitation)

- Static water levels, Tritium, chemistry, and trace metals
- Aquifer mapping
- CoCoRaHS, precipitation, hail and snow

Land-Use and Land-Cover Change

- Quantify changes in landuse and land cover spanning periods of prolonged drought
- Document fine scale landscape dynamics to examine landscape change

Social Science and Policy

- Household decision making
- Livelihood impacts and adaptation to drought
- Impacts of policy and associated communication on decision making

Sustainable Agricultural Practices

- Crop diversification through cover cropping
- Greenhouse gas emissions and global warming potential of different cropping systems















BE BOLD. Shape the Future. **New Mexico State University**



Extension & Outreach

- Drought and CoCoRaHS workshops
- Popular press articles, fact sheets, videos
- Web & social media Web: arid.nmsu.edu Twitter: **@AgroEcoResil** Facebook: agroecoresilience Instagram: @agroecoresilience



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- •Union, NM
- •Cimarron, OK
- •Las Animas, CO
- Extension and outreach efforts focused within the highlighted USDA **Climate Hub Regions**

Impacts

- Proactive management solutions building ecological, economic, and social resilience in response to drought and climate variability
- Landowners and land managers contributing hydrological, precipitation and land cover data via participatory methods
- Enhanced CoCoRaHS and well monitoring infrastructure at a regional level



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